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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,278	11/28/2003	John Love	CU- 3471	1144
26530	7590	11/01/2004	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1200 CHICAGO, IL 60604			CONNELLY CUSHWA, MICHELLE R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/724,278

Applicant(s)

LOVE ET AL.

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0504</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) or 120 as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Australia on May 31, 2001. It is noted, however, that applicant has not filed a certified copy of the Australia (PR5375) application as required by 35 U.S.C. 119(b).

### ***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statement filed on May 10, 2004 have all been considered and made of record (note the attached copy of form PTO-1449).

### ***Drawings***

Four (4) sheets of formal drawings were filed on November 28, 2003 and have been accepted by the Examiner.

### ***Specification***

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-2, 5-9 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwaderer et al. (DE 3516899 A1).**

Regarding claims 1, 13 and 14; Schwaderer et al. discloses a method of splicing a first optical waveguide (1), having a first core (3), to a second optical waveguide (2) having a second core (4) with a cladding (7), the method comprising the steps of:

- etching an exposed end of the first optical waveguide (1) with a first etching solution that is selected to preferentially etch the first core (3), wherein the first optical waveguide (1) is etched for a first period of time sufficient to create a recess of depth d at the end of the first optical waveguide (1);

- etching a terminal end of the second optical waveguide (2) in a manner so as to create a tapered end;
- positioning the tapered end of the second optical waveguide (2) within the recess of the first optical waveguide (1); and
- securing the tapered end within the recess (see the abstract and the Figure).

Regarding claim 2; the step of positioning the tapered end of the second optical waveguide within the recess of the first optical waveguide includes the step of placing the tip of the tapered end within the recess and then aligning the first and second optical waveguides by moving the waveguides together so that the tapered end is positioned with the recess of the first optical waveguide.

Regarding claim 5; the terminal end has a length approximately equal to the depth.

Regarding claim 6; the recess is etched to a depth  $d$  slightly greater than the length of the tapered end.

Regarding claim 7; the tapered end is terminated by a substantially flat surface orientated substantially transversely to the second core.

Regarding claim 8; the cladding (7) is down-tapered towards the substantially flat end face, so that the substantially flat surface has a diameter substantially equal to that of the second core.

Regarding claim 9; the first and second waveguides are optical fibers.

Regarding claim 12; the projection is in the form of a tapered end.

**Claims 1-2, 5-7, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Honmo (JP 08-179147 A).**

Regarding claims 1 and 13; Honmo discloses a method of splicing a first optical waveguide (4), having a first core (2), to a second optical waveguide (6) having a second core (5) with a cladding, the method comprising the steps of:

- etching an exposed end of the first optical waveguide (4) with a first etching solution that is selected to preferentially etch the first core (2), wherein the first optical waveguide (4) is etched for a first period of time sufficient to create a recess of depth d at the end of the first optical waveguide (4);
- etching a terminal end of the second optical waveguide (6) in a manner so as to create a tapered end;
- positioning the tapered end of the second optical waveguide (6) within the recess of the first optical waveguide (4); and
- securing the tapered end within the recess (see the abstract and the Figures 1 and 2).

Regarding claim 2; the step of positioning the tapered end of the second optical waveguide within the recess of the first optical waveguide includes the step of placing the tip of the tapered end within the recess and then aligning the first and second optical waveguides by moving the waveguides together so that the tapered end is positioned with the recess of the first optical waveguide.

Regarding claim 5; the terminal end has a length approximately equal to the depth.

Regarding claim 6; the recess is etched to a depth  $d$  slightly greater than the length of the tapered end.

Regarding claim 7; the tapered end is terminated by a substantially flat surface orientated substantially transversely to the second core.

Regarding claim 10; the first waveguide is a planar waveguide and the second waveguide is an optical fiber.

Regarding claim 12; the projection is in the form of a tapered end.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 3-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwaderer et al. (DE 3516899 A1) in view of Stöckle et al. ("High-quality near-field optical probes by tube etching").**

Regarding claim 3; Schwaderer et al. discloses all of the limitations of claim 3 as applied above except for the step of etching comprising the step of applying a tube etching process. The terminal end of the second optical waveguide (2) is etched in a manner so as to create a tapered end in the invention Schwaderer et al.

Stöckle et al. discloses a tube etching process to form tapered ends on the terminal ends of optical fibers (see Figure 3). Stöckle et al. teaches that the disclosed tube etching process provides a fiber tip that is smoother, which will result in a better coupling efficiency because less light will be scattered or lost at a smoother surface. Therefore, one of ordinary skill in the art would have found it obvious to use the tube etching process taught by Stöckle et al. to form a tapered end of an optical fiber or waveguide that is smoother in order to increase coupling efficiency in the invention of Schwaderer et al.

Regarding claim 4; the tube etching process disclosed by Stöckle et al. includes the steps of:

- utilizing an etch resistant jacket about the cladding of the waveguide in which the core is tapered; and
- exposing an end region of the waveguide to an etching solution for a period of time sufficient to create the tapered end at the terminal end (see the third paragraph of the description and Figure 1 of Stöckle et al.).

Regarding claim 11; Schwaderer et al. discloses all of the limitations of claim 11 as applied above except for specifically stating that the tapered end is secured within the recess using a bonding agent. One of ordinary skill in the art would have found it obvious to incorporate a bonding agent in the invention of Schwaderer et al. to secure the tapered end of the optical fiber within the recess to prevent the optical fibers from decoupling, thereby preventing loss of signal, since the practice of securing



Art Unit: 2874

coupled/spliced optical waveguides with bonding agents is well known and elementary in the art.

**Claims 3-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honmo (JP 08-179147 A) in view of Stöckle et al. ("High-quality near-field optical probes by tube etching").**

Regarding claim 3; Honmo discloses all of the limitations of claim 3 as applied above except for the step of etching comprising the step of applying a tube etching process. The terminal end of the second optical waveguide (6) is etched in a manner so as to create a tapered end in the invention Honmo.

Stöckle et al. discloses a tube etching process to form tapered ends on the terminal ends of optical fibers (see Figure 3). Stöckle et al. teaches that the disclosed tube etching process provides a fiber tip that is smoother, which will result in a better coupling efficiency because less light will be scattered or lost at a smoother surface. Therefore, one of ordinary skill in the art would have found it obvious to use the tube etching process taught by Stöckle et al. to form a tapered end of an optical fiber or waveguide that is smoother in order to increase coupling efficiency in the invention of Honmo.

Regarding claim 4; the tube etching process disclosed by Stöckle et al. includes the steps of:

- utilizing an etch resistant jacket about the cladding of the waveguide in which the core is tapered; and

- exposing an end region of the waveguide to an etching solution for a period of time sufficient to create the tapered end at the terminal end (see the third paragraph of the description and Figure 1 of Stöckle et al.).

Regarding claim 11; Honmo discloses all of the limitations of claim 11 as applied above except for specifically stating that the tapered end is secured within the recess using a bonding agent. One of ordinary skill in the art would have found it obvious to incorporate a bonding agent in the invention of Honmo to secure the tapered end of the optical fiber within the recess to prevent the optical waveguides from decoupling, thereby preventing loss of signal, since the practice of securing coupled/spliced optical waveguides with bonding agents to prevent decoupling and loss of signal is well known and elementary in the art.

### ***Conclusion***

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Art Unit: 2874

*Michelle R. Connelly-Cushwa*

Michelle R. Connelly-Cushwa

Patent Examiner

October 25, 2004